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EXAMINER	
PEREZ DAPLE, AARON C	
ART UNIT	**PAPER NUMBER**
2154	

DATE MAILED: 10/21/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/824,951	HUANG, JAMES CHING-LIANG	
	Examiner	Art Unit	
	Aaron C Perez-Daple	2154	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *03 April 2001*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-70* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-70* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. This Action is in response to Application filed 4/3/01.

2. Claims 1-70 are presented for Examination.

3. This Action is non-Final.

Claim Objections

4. **Claim 26 and 61** are objected to because of the following informalities: Line 2 of the claims recites "behaves a said single router" where it should recite --behaves as said single router--. Appropriate correction is required.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. **Claims 27 and 62** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Specifically, the claims recite the limitation "N routing interfaces." The scope of the invention is not clear, because "N" can be interpreted as any number. For the purpose of applying prior art, the Examiner interprets that "N" means one or more.

7. **Claims 30-35 and 65-70** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Specifically, the terms "the switches" in line 2 and "said switch" in line 5 of the claims lack proper antecedent basis. Appropriate correction is required.

8. As dependent claims, claims 31-34 and 64-70 suffer from the same deficiencies as claims 30 and 65.

9. **Claims 3-5, 28, 29, 34, 38-40, 63, 64 and 69** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Specifically, the claims recite providing layer 2 and layer 3 switches. However, as noted on pg. 17, first paragraph, of Tanenbaum (Andrew S. Tanenbaum, "Computer Networks: Third Edition," Prentice Hall, New Jersey, 1996.), the layer number and the function(s) of each layer varies between networks. The claims are not directed towards a specific network or protocol(s). Therefore, the scope of the claims is indeterminate because it is unclear what specific functions are associated with the claimed layer 2 and layer 3 switches. For the purpose of applying prior art, the Examiner interprets that layer 2 is the data-link layer and layer 3 is the network layer.

10. **Claims 28, 29, 63 and 64** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Specifically, claims 28 and 63 depend from claims 24 and 59, respectively. Claims 24 and 59 recite that "at least one of said internetworking devices must be a Layer-3 capable switch." "At least one" implies that there may be more than one layer-3 capable switch, therefore "said Layer-3 capable switch" recited in line 2 of claims 28 and 63 lacks proper antecedent basis. Moreover, for the case with plural layer-3 switches, the claim appears to require that more than one head router would be selected, which is contrary to the invention as disclosed in the specification. For the purpose of applying prior

art, the Examiner interprets that any teaching of selecting a head (master) router is sufficient to teach the limitations of the claims.

As dependent claims, claims 29 and 64 suffer from the same deficiencies as claims 28 and 63.

Claim Rejections - 35 USC § 102

10. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

11. **Claims 1-3, 16, 18, 23, 30, 36-38, 51, 53, 58 and 65** are rejected under 35 U.S.C. 102(b) as being anticipated by Melvin (US 5,802,333) (hereinafter Melvin).

12. As for claims 1 and 36, Melvin discloses a method and system for operating internetworking devices, the method comprising the steps of:

providing a plurality of the internetworking devices in a stack configuration for interconnecting networks (col. 3, lines 44-60; Fig. 5); and

configuring said stack of internetworking devices such that said stack of internetworking devices appear as a single said internetworking device to said interconnected networks (col. 3, lines 44-60).

13. As for claims 2 and 37, Melvin discloses the method and system of claims 1 and 36, wherein the internetworking device in the step of providing is a switch (col. 3, lines 44-60).

14. As for claims 3 and 38, Melvin discloses the method and system of claims 2 and 38, wherein the internetworking device in the step of providing is a Layer 2 switch (col. 5, lines 26-34).

15. As for claims 16 and 51, Melvin discloses the method and system of claims 2 and 37, wherein the step of configuring further comprises a step of providing of software algorithms which are resident in each of said switches of said stack (col. 4, line 66 – col. 5, line 3).

16. As for claims 18 and 53, Melvin discloses the method and system of claims 1 and 36, wherein when one of said internetworking devices of said stack in the step of providing is elected as a master, said master internetworking device communicates stack-wide configuration information to the remaining internetworking devices, which are slaves (col. 3, lines 50-60).

17. As for claims 23 and 58, Melvin discloses the method and system of claims 1 and 36, wherein in the step of configuring, said stack of internetworking devices behave externally as a single router (col. 1, lines 9-15; col. 3, lines 44-60).

18. As for claims 30 and 65, Melvin discloses a system and method of operating internetworking devices, said method comprising the steps of:

providing a plurality of the switches in a stack configuration for interconnecting networks (col. 3, lines 44-60; Fig. 5); and

configuring said stack of switches such that said stack of switches appear as a single said switch to said interconnected networks (col. 3, lines 44-60).

19. **Claims 30-35 and 65-70** are rejected under 35 U.S.C. 102(e) as being anticipated by Sugihara (US 6,785,272 B1) (hereinafter Sugihara).

20. As for claims 30 and 65, Sugihara discloses a system and method of operating internetworking devices, said method comprising the steps of:

providing a plurality of the switches in a stack configuration for interconnecting networks (col. 4, line 66 – col. 5, line 11; Fig. 4); and

configuring said stack of switches such that said stack of switches appear as a single said switch to said interconnected networks (col. 4, line 66 – col. 5, line 11).

21. As for claims 31 and 66, Sugihara discloses the method and system of claims 30 and 65, wherein each said switch of said stack of switches in the step of providing periodically establishes adjacency with discovered stack neighbors in order to develop a complete topology map (step 806, Fig. 8; col. 10, line 66 – col. 11, line 13).

22. As for claims 32 and 67, Sugihara discloses the method and system of claims 31 and 66, wherein each switch of said stack of switches builds a stack tree and elects a master switch based upon said complete topology map (col. 5, lines 16-27).

23. As for claims 33 and 68, Sugihara discloses the method and system of claims 32 and 67, wherein said master switch executes a routing protocol when a routing function is provided (col. 8, line 57 – col. 9, line 10).

24. As for claims 34 and 69, Sugihara discloses the method and system of claims 33 and 68, wherein at least one of said switches of said stack must be a Layer-3 capable switch in order to provide said routing function (This is considered inherent for any switch/router using

network protocols, where layer 3 is interpreted as the network layer, because this is required for routing packets on the network.; col. 8, line 57 – col. 9, line 10).

25. As for claims 35 and 70, Sugihara discloses the method and system of claims 30 and 65, wherein said stack of switches in the step of configuring operate in accordance with a stack-wide configuration information, which said stack-wide configuration information is stored in each said switch of said stack (col. 5, lines 16-49).

Claim Rejections - 35 USC § 103

26. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

27. **Claims 4, 5, 21, 22, 24-26, 28, 29, 39, 40, 56, 57, 59-61, 63 and 64** are rejected under 35 U.S.C. 103(a) as being unpatentable over Melvin in view of Kanekar et al. (US 6,751,191 B1) (hereinafter Kanekar).

28. As for claims 4, 5, 39 and 40, although arguably inherent to Melvin for the case where the switch is used as a network switch, Melvin does not explicitly disclose that the switches may be layer 3 switches or a mix of layer 2 and layer switches. Kanekar teaches plural internetworking devices comprising layer 3 and a mix of layer 2 and layer 3 switches (col. 2, line 39 – col. 3, line 4). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Melvin by providing layer 3 and a mix of layer 2 and layer 3

switches in order to efficiently route data over a network, as taught by Kanekar (col. 2, lines 6-24).

29. As for claims 21 and 56, Melvin does not specifically teach that the internetworking device may comprise a local database of MAC addresses learned locally, and a remote database of MAC addresses learned from one or more remote internetworking nodes. Kanekar teaches a local database of MAC addresses learned locally, and a remote database of MAC addresses learned from one or more remote internetworking nodes, wherein each of said internetworking devices executes a database synchronization algorithm which synchronizes table entries of said remote database with an external database of said one or more remote internetworking devices (col. 2, line 49 – col. 3, line 49). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Melvin by using a local database of MAC addresses learned locally, and a remote database of MAC addresses learned from one or more remote internetworking nodes, wherein each of said internetworking devices executes a database synchronization algorithm which synchronizes table entries of said remote database with an external database of said one or more remote internetworking devices, in order to efficiently route data over a network, as taught by Kanekar (col. 2, lines 6-24).

30. As for claims 22 and 57, Melvin does not specifically disclose advertising database entries learned locally to every internetworking node. Kanekar teaches advertising database entries learned locally to every internetworking node (col. 6, lines 21-39). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Melvin

by advertising database entries learned locally to every internetworking node, in order to efficiently route data over a network, as taught by Kanekar (col. 2, lines 6-24).

31. As for claims 24-26, 28, 29, 59-61, 63 and 64, although arguably inherent to Melvin for the case where the switch is used as a network switch, Melvin does not explicitly disclose that the switches may be layer 3 switches. Kanekar teaches plural internetworking devices comprising layer 3 switches (col. 2, line 39 – col. 3, line 4). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Melvin by providing layer 3 switches in order to efficiently route data over a network, as taught by Kanekar (col. 2, lines 6-24). The Examiner notes that when acting as a network router, the switch would inherently comprise a layer-3 capable switch, where the Examiner interprets layer 3 as the network layer, because otherwise the router could not communicate with the network.

Additional limitations to the claims are taught by Melvin, as detailed below.

32. As for claims 25 and 60, Melvin discloses the method and system of claims 24 and 59, wherein when said stack behaves as said single router, all said switches of said stack route packets substantially simultaneously (col. 2, lines 47-50; col. 7, lines 38-45).

33. As for claims 26 and 61, Melvin disclose the method and system of claims 25 and 60, wherein a packet routed through said stack which behaves a said single router is routed exactly once by one of said switches (This is considered inherent for the case where a packet is mapped to an address in the master switch.; col. 7, lines 46-61).

34. **Claims 6-9, 15, 17, 19, 20, 27,41-44, 50, 52, 54, 55 and 62** are rejected under 35 U.S.C. 103(a) as being unpatentable over Melvin in view of Sugihara (US 6,785,272 B1) (hereinafter Sugihara).

35. As for claims 6 and 41, although arguably inherent to Melvin, Melvin does not specifically teach communicating with a software agent external to the stack of switches for management of the stack of switches. Sugihara teaches communicating with a software agent external to the stack of switches for management of the stack of switches (col. 4, line 66 – col. 5, line 11). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Melvin by communicating with a software agent external to the stack of switches for management of the stack of switches in order to enable switching over a network and to provide a flexible control to the switches connected as a stacked switching system, as taught by Sugihara (col. 3, lines 14-25).

36. As for claims 7, 8, 42 and 43, Melvin does not specifically teach that the software agent may further communicate only with a single elected master switch of the stack of switches. Sugihara teaches that the software agent may communicate only with a single elected master switch of a stack of switches (col. 4, line 66 – col. 5, line 11). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Melvin by using a software agent which communicates only with a single elected master switch of the stack of switches in order to enable switching over a network and to provide a flexible control to the switches connected as a stacked switching system, as taught by Sugihara (col. 3, lines 14-25).

37. As for claims 9 and 44, Melvin does not specifically teach electing a new master switch to communicate with the software agent when the elected master switch fails. Sugihara teaches electing a new master switch to communicate with the software agent when the elected master switch fails (col. 6, line 59 – col. 7, line 6). It would have been obvious to one of ordinary skill in the art to elect a new master switch to communicate with the software

agent when the elected master switch fails in order to provide a flexible control to the switches and improve the robustness of the system, as taught by Sugihara (col. 3, lines 14-25).

38. As for claims 15 and 50, Melvin does not specifically teach that one or more of said switches are hot swappable. Sugihara teaches the use of one or more hot swappable switches (col. 4, lines 50-61). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Melvin by using one or more hot swappable switches, in order to provide a flexible system topology without the need to reboot and improve system robustness, as taught by Sugihara (col. 3, lines 14-25; col. 4, lines 50-61).

39. As for claims 17 and 52, although arguably inherent to Melvin, Melvin does not specifically teach the use of a spanning tree protocol. Sugihara teaches the use of a spanning tree protocol (col. 11, lines 45-67). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Melvin by making said stack of internetworking devices appear as said single internetworking device with respect to a spanning tree protocol in order to enable switching over a network and to provide a flexible control to stacked switches having a flexible topology, as taught by Sugihara (col. 3, lines 14-25; col. 4, lines 50-61).

40. As for claims 19 and 54, Melvin does not specifically disclose that stack-wide information from the master overwrites stored stack-wide information of the slave. Sugihara teaches a method and system similar to claims 18 and 53 wherein stack-wide information from the master overwrites stored stack-wide information of the slave (col. 5, lines 16-40). It would have been obvious to one of ordinary skill in the art at the time of the invention to

modify Melvin by having stack-wide information from the master overwrite stored stack-wide information of the slave in order to ensure consistency between the switches and to provide an efficient switching system, as taught by Sugihara (col. 5, lines 16-40).

41. As for claims 20 and 55, Melvin does not specifically disclose that a configuration command received by the master from a management station is globally distributed to each slave. Sugihara teaches a method and system similar to claims 18 and 53 wherein a configuration command received by the master from a management station is globally distributed to each slave (col. 4, line 66 – col. 5, line 27). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Melvin by having a configuration command received by the master from a management station globally distributed to each slave in order to ensure consistency between the switches and to provide an efficient switching system, as taught by Sugihara (col. 5, lines 16-40).

42. As for claims 27 and 62, Melvin does not specifically teach configuring routing interfaces with a unique route interface IP address. Sugihara teaches configuring routing interfaces with a unique route interface IP address (IP addresses are inherent to the use of the IP protocol for directing packets to their destination.; col. 8, line 57 – col. 9, line 10). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Melvin by configuring routing interfaces with a unique route interface IP address in order to route traffic using the IP or TCP/IP protocols, as taught by Sugihara (col. 8, line 57 – col. 9, line 10).

43. **Claims 10-13 and 45-48** are rejected under 35 U.S.C. 103(a) as being unpatentable over Melvin in view of Sugihara and in further view of Kanekar.

44. As for claims 10 and 45, Melvin and Sugihara do not explicitly teach associating a master IP address with the elected master switch, and when the master switch fails, the newly elected master switch assuming said master IP address. Kanekar teaches associating a master IP address with the elected master switch, and when the master switch fails, the newly elected master switch assuming said master IP address (col. 2, lines 25-38). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Melvin and Sugihara by associating a master IP address with the elected master switch, and when the master switch fails, the newly elected master switch assuming said master IP address in order to provide system redundancy in the case of failure of the master switch, as taught by Kanekar (col. 2, lines 6-10).

45. As for claims 11, 12, 46 and 47, Melvin and Sugihara do not explicitly disclose that each switch further performs a step of periodically advertising its discovered stack neighbors to other said stack switches. Kanekar teaches a plurality of switches wherein each switch further performs a step of periodically advertising its discovered neighbors to other switches (col. 7, lines 18-48; col. 8, line 41 – col. 9, line 2). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the teachings of Melvin and Sugihara by having each switch periodically advertise its discovered stack neighbors to other said stack switches in order to maintain updated and synchronized routing tables, as taught by Kanekar (col. 8, line 41 – col. 9, line 2).

46. As for claims 13 and 48, Melvin and Sugihara do not explicitly disclose that in response to advertising each said stack switch builds a complete topology map of said stack configuration which is current. Kanekar teaches building a complete topology map of a stack

configuration which is current in response to advertising (As understood by one of ordinary skill in the art, the topology map is embodied in the layer 3 table.; col. 2, line 49 – col. 3, line 4). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the teachings of Melvin and Sugihara by building a complete topology map of a stack configuration which is current in response to advertising in order to maintain updated and synchronized routing tables, as taught by Kanekar (col. 8, line 41 – col. 9, line 2).

47. **Claims 14 and 49** are rejected under 35 U.S.C. 103(a) as being unpatentable over Melvin, Sugihara and Kanekar in further view of Herz et al. (US 5,754,939) (hereinafter Herz).

48. As for claims 14 and 49, Melvin, Sugihara and Kanekar do not specifically teach the use of a minimal cost spanning tree. Herz teaches the use of a minimal cost spanning tree for creating a topology map (col. 49, lines 6-30). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the teachings of Melvin, Sugihara and Kanekar by using a minimal cost spanning tree in order to improve network efficiency by constructing the most efficient routes, as taught by Kanekar (col. 49, lines 6-30).

Conclusion

49. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

US 5,743,599, note teaches swapping master IP address on failure of master;

US 6,006,259, note col. 3;

US 5,892,932, note abstract;

US 5,629,685, note Fig. 1;

US 6,556,541 B1, note teaches MAC table updates.

50. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Aaron C Perez-Daple whose telephone number is (703) 305-4897. The examiner can normally be reached on 9am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Follansbee can be reached on (703) 305-8498. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

10/17/04

Aaron Perez-Daple

N. Follansbee